CHAPTER 1: THE CONFORMITY ASSESSMENT PROJECT

LINKING TRANSPORTATION AND AIR QUALITY PLANNING:

IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS

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Chapter 1

THE CONFORMITY ASSESSMENT PROJECT

The Clean Air Act Amendments of 1990 require far-reaching efforts to assure that transportation investments in nonattainment and maintenance areas are consistent with state commitments to meet national air pollution standards. The statutory mandate was implemented through major federal regulations issued in November 1993 by the U.S. Environmental Protection Agency, with the concurrence of the U.S. Department of Transportation. Known within the transportation and air quality professional communities as the "transportation conformity" (or "conformity") rule,[1] these regulatory procedures have raised the hopes of many for improvements in transportation decision making, while also motivating considerable criticism from some affected agencies and concerned stakeholders.

Project Purposes

The research reported here, jointly initiated by the U.S. Environmental Protection Agency and the Federal Highway Administration, was planned as Phase 1 of a comprehensive Conformity Assessment Project. By carefully examining experience in 15 areas, the research will document and develop a better understanding of how the transportation conformity regulations have been implemented and with what early effects on transportation planning and air quality regulation at the metropolitan and state levels.

The overall study was undertaken to inform and stimulate further thinking about conformity in the transportation and air quality practitioner communities. It was also intended to provide information to elected officials, stakeholder groups, and interested citizens about an important effort to coordinate and make consistent the effects of federal transportation and air pollution policies, which in the past have operated quite independently. More specifically, the research reported here was designed to discover:

- the ways in which conformity works effectively and achieves its intended ends,
- the ways in which conformity has been problematic – and why – and how areas have dealt with these problems,
- conformity challenges for the future.

Phase 1, reported on here, covers the period from 1991 through January of 1998, which includes experience under the Interim Conformity guidelines issued by EPA and DOT in 1991 and under the November 1993 conformity regulations. Phase 2 will revisit the issues of Phase 1 after several more years of experience, focusing particularly on whether and how the 1997 conformity amendments, as well as further implementation of other aspects of the 1990 CAAA, have affected how conformity works at the met-

[1]All references to "conformity" in this report relate to the "transportation conformity" regulations, which apply only to highway and transit projects. The CAAA of 1990 also require "general conformity" procedures for other federal projects/actions.

ropolitan and state levels.

Although no study of conformity can ignore the technical issues of transportation and air quality modeling that are central to the practice of conformity, this research was intended to deal primarily with *institutional impacts, effects on planning process,* and *substantive planning outcomes*. We have inquired how the conformity modeling requirements have affected institutional development in the study sites and how the modeling process and results have shaped the conformity decision-making. It should be carefully noted, however, that the study was not designed to provide a careful examination, let alone an evaluation, of modeling practices in each study site, nor to assess more generally the technical dimensions of the conformity process. Conclusions about the technical dimensions of transportation and air quality modeling are beyond the scope of this research.

Focal Questions

Three overarching questions have organized this research:

(1) How has conformity affected key agencies and constituencies' organizational capacity and relationships? Conformity tests organizational capacity in at least two ways. First, it makes *technical and analytic* demands on involved agencies and stakeholder groups. The core public agencies responsible for the analysis need not only computer modeling proficiency to forecast regional transportation patterns and associated pollution but also the capacity to evaluate the forecasts and help policy makers understand their implications. Other agencies and stakeholders that do not themselves perform modeling tasks nonetheless require sufficient technical sophistication to assess the process and evaluate policy options and impacts. Second, through the interagency consultation process, conformity requires the development of *institutional relationships* that did not previously exist in most locales. Conformity seeks to coordinate transportation and air quality – formerly nearly independent policy systems – and foster collaboration among agencies and constituency groups that historically have had very different perspectives. In some jurisdictions, indeed, these stakeholders viewed each other with deep suspicion or had clashed on policy matters. This cooperation was supposed to occur in the larger context of the ISTEA-mandated transportation planning process, which involves many planning factors other than air quality conformity.

Recognizing these demands, the research looked closely at institutional issues. How well have agencies and stakeholders coped with and adapted to the technical and coordination requirements of conformity? Did they have sufficient resources to manage its demands, or did they have to upgrade their organizational capacity and build new relationships? What positive practices have developed? What problems have arisen – and why?

(2) How has conformity changed the transportation planning/programming process and its results? Conformity places new demands on the transportation planning and programming process, in conjunction with elements of ISTEA that mandate broader par-

ticipation in planning and fiscal constraint of plans. Planners and decision makers in nonattainment areas must give air quality a far more prominent place in their considerations. In the face of potential financial penalties and restrictions on their ability to proceed with new transportation projects, they must assure that their policies and investment choices – assessed over a 20-year time horizon – are consistent with commitments made by their state to reduce pollution levels.

The research therefore asked how transportation planners and policy makers have adapted their previous practices to fulfill the obligations of the conformity regulations. It explored the organization of the transportation planning process, patterns of participation and interagency coordination, specific roles played by different types of agencies and stakeholders, and whether and how the outcomes of the planning/programming process were materially changed by conformity requirements. The research looked both for notable conformity-related innovations in the conduct of transportation planning and for problems and dilemmas created for planners and policy officials by the 1993 conformity regulations.

(3) How has conformity changed air quality planning and regulation? The conformity regulations seek to assure that decisions made in transportation policy are consistent with the requirements of the Clean Air Act Amendments of 1990 and with the specific planning and regulatory actions that each state is taking to reduce pollution to the levels mandated by the CAAA. In making this connection, however, the regulations anticipate that issues that arise in transportation planning will in turn affect the choices that state officials make in pursuing air quality goals.

The study therefore inquired how transportation conformity has affected air quality planning and regulation. Specifically, it inquired whether and how conformity has affected civic debate about transportation goals and their interaction with air quality goals, whether conformity has affected the emission budgets developed in State Implementation Plans under the CAAA of 1990, and whether conformity has affected the inclusion of transportation control measures (TCMs) and other mobile source controls in SIPs.

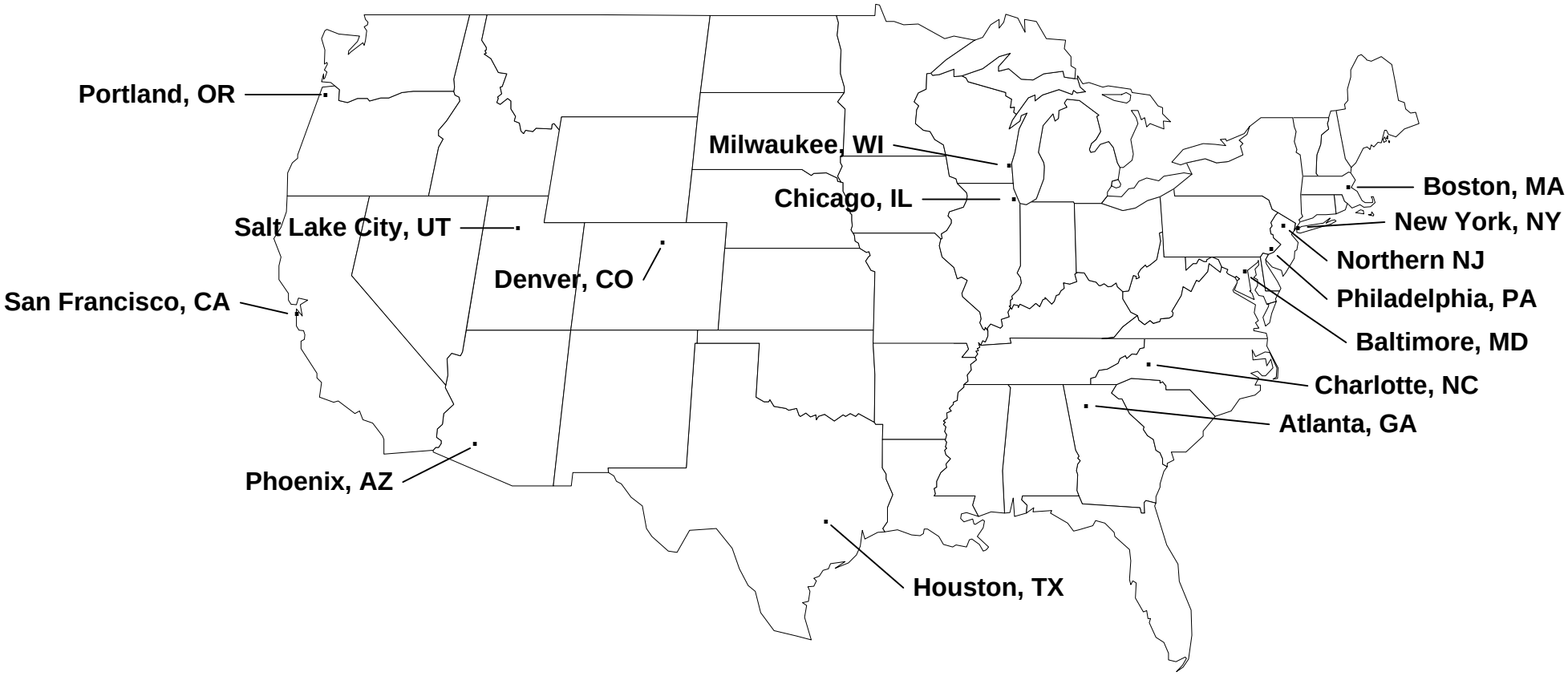
Selection of the Research Sites

To ground the study in the realities of actual practice and to gather data, the researchers, in consultation with staff in the Environmental Protection Agency and the Federal Highway Administration, selected 15 nonattainment areas for careful study. (See Figure 1-1.) Ten of the selected areas – marked by an asterisk below – had been studied by one of the researchers in a previous project (1992-1994) conducted on behalf of EPA and FHWA. The earlier research had more generally investigated implementation of the transportation provisions of the CAAA of 1990 and the air quality provisions of ISTEA.[2] Five additional areas were

[2]For results of that study, see Arnold M. Howitt, Joshua P. Anderson, and Alan Altshuler, *The New Politics of Transportation and Clean Air* (Cambridge, MA: Harvard University, John F. Kennedy School of Government, Taubman Center for State and Local Government, November 1984; also published by the U.S. Department of Transportation, Federal Highway Administration, FHWA-PD-97-010, DOT-VNTSC-FHWA-97-5, February 1997); and Joshua P. Anderson

Figure 1-1

Nonattainment Areas in the Study



selected for the current study specifically because they were perceived by the federal agencies or the researchers to have had "interesting" conformity experiences that warranted examination. The 15 nonattainment areas selected for this research are:

- Atlanta, Georgia,*
- Baltimore, Maryland,*
- Boston, Massachusetts,*
- Charlotte, North Carolina,*
- Chicago, Illinois,*
- Denver, Colorado,
- Houston, Texas,*
- Milwaukee, Wisconsin,*
- New York, New York
- Northern New Jersey
- Philadelphia, Pennsylvania,*
- Phoenix, Arizona,*
- Portland, Oregon,
- Salt Lake City, Utah*
- San Francisco, California

Table 1-1 provides information about population growth and auto usage in these 15 study sites.

The selected areas were *not* meant to constitute – nor are they – a random sample of nonattainment areas subject to the 1993 conformity rule. Instead, they were selected to concentrate on *large metropolitan areas with more severe air pollution problems* (with a primary, but not exclusive, emphasis on ozone). As shown in Table 1-2, 13 of the selected areas were classified at least "moderate" for ozone, and 10 of these were in nonattainment status for at least one other pollutant. In addition, Denver (transitional for ozone) was a "moderate 2" area for carbon monoxide and "moderate" for particulate matter, while Portland (marginal for ozone) was also a "moderate 1" area for carbon monoxide. (Some of these areas have subsequently been reclassified, as is also indicated in Table 1-2.) Beyond these criteria, the researchers sought to assure diversity by including:

- nonattainment areas in all regions of the country;
- areas growing rapidly in population and geographic spread, as well as those that were growing much more slowly in those respects;
- areas with mature highway systems and substantial transit usage, as well as those significantly adding to their highway networks and currently having more limited transit systems.

In making these selections, the researchers and sponsors believed that this sample of 15 research sites provided a significant number of individual cases that varied in several respects potentially relevant to conformity. They felt that an intensive examination of the conformity process in these jurisdictions would shed important light on how the new regulations were being implemented in major areas, identify situations in which effective implementation strategies were being employed, and reveal

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and Arnold M. Howitt, "Clean Air Act: SIPs, Sanctions, and Conformity," *Transportation Quarterly* (Summer 1995).

Table 1-1

GROWTH RATES OF POPULATION AND VEHICLE MILES TRAVELED, BY STUDY SITE

NONATTAIN-MENT AREA	POPULATION						VMT				
	1980	1990	1995	Percent Annual Growth ('80-'90)	Percent Annual Growth ('90-'95)	Percent Annual Growth ('80-'95)	1990	1995* or 1996**		Percent Annual Growth ('90-'95 or '90-'96)	VMT Per Capita ('95 or '96)d
Atlanta	1,989,341	2,653,159	3,038,050	2.9%	2.7%	2.9%	81,472,984	105,218,456	**	4.4%	34.6
Baltimore	2,173,989	2,348,219	2,432,993	0.8%	0.7%	0.8%	49,900,000	55,900,000	*	2.3%	23.0
Boston	4,945,835	5,204,103	5,274,317	0.5%	0.3%	0.4%	59,816,200	64,412,700	**	1.2%	12.2
Charlotte	566,838	686,574	760,939	1.9%	2.1%	2.0%	14,515,000	18,442,000	*	4.9%	24.2
Chicago	7,171,420	7,332,926	7,641,329	0.2%	0.8%	0.4%	127,402,856	140,834,243	*	2.0%	18.4
Denver	1,618,461	1,848,319	2,085,158	1.3%	2.4%	1.7%	39,100,000	50,900,000	**	4.5%	24.4
Houston	3,118,480	3,731,029	4,164,393	1.8%	2.2%	2.0%	90,400,000	105,800,000	*	3.2%	25.4
Milwaukee	1,693,289	1,735,364	1,780,769	0.2%	0.5%	0.3%	33,072,000	35,900,000	*	1.7%	20.2
No. New Jersey	4,961,510	5,108,929	5,243,598	0.3%	0.5%	0.4%	125,153,923	129,352,902[a]	**	0.6%[b]	24.7
New York	11,063,184	11,379,764	11,462,260	0.3%	0.1%	0.2%	133,577,052	132,284,161	*	-0.2%[c]	11.5
Philadelphia	3,682,450	3,728,991	3,731,703	0.1%	0.0%	0.1%	64,565,000	70,195,000	**	1.4%	18.8
Phoenix	1,600,093	2,238,498	2,563,582	3.4%	2.7%	3.2%	49,600,000	57,000,000	*	2.8%	22.2
Portland	1,050,418	1,174,291	1,300,729	1.1%	2.1%	1.4%	20,413,000	22,437,000	*	1.9%	17.2
Salt Lake City	765,606	913,897	1,023,765	1.8%	2.3%	2.0%	20,130,479	25,864,357	**	4.3%	25.3
San Francisco	5,179,759	6,020,147	6,302,933	1.5%	0.9%	1.3%	113,389,000	123,666,900	*	1.8%	19.6

[a] 1999 VMT.

[b] 1990-1999.

[c] NYMTC does not regard negative VMT growth in this period as indicative of future trends.

[d] 1996 per capita rates are calculated using 1995 population.

Table 1-2

Nonattainment Classifications for Study Sites by Pollutant

NONATTAINMENT AREA	1990 OZONE	1990 CARBON MONOXIDE	1990 PM-10
Atlanta	Serious		
Baltimore	Severe 1	Moderate 2 Redesignated to Attainment 1995	
Boston	Serious	Moderate 2 Redesignated to Attainment 1996	
Charlotte	Moderate Redesignated to Attainment 1995	Not Classified Redesignated to Attainment 1995	
Chicago	Severe 2		Moderate
Denver	Transitional	Moderate 2 Reclassified to Serious 1997	Moderate
Houston	Severe 2		
Milwaukee	Severe 2		
Northern New Jersey	Severe 2	Moderate 2	
New York	Severe 2	Moderate 2	Moderate
Philadelphia	Severe 1	Moderate 1 Redesignated to Attainment 1996	
Phoenix	Moderate Reclassified to Serious 1997	Moderate 1 Reclassified to Serious 1996	Moderate Reclassified to Serious 1996
Portland	Marginal Redesignated to Attainment 1997	Moderate 1 Redesignated to Attainment 1997	
Salt Lake City	Moderate Redesignated to Attainment 1997	Not Classified	Moderate
San Francisco	Moderate Redesignated to Attainment 1995; Proposed Reclassification to Nonattainment 1997	Moderate 1 Redesignated to Attainment 1998	

problems that had emerged from this experience. It is worth noting, however, that the sample does not include rural nonattainment areas, small metropolitan areas, or areas with minimal pollution problems. So the research findings should be interpreted cautiously if interest focuses particularly on such areas.

Research Methods and Data

Data for this study was collected primarily during the period from fall 1996 through spring 1998, with some additional work conducted until February 1999. In the course of the project, the researchers gathered and assessed several types of information about the 15 study sites:

- Background data was compiled on all study areas, including official documents prepared in the course of their air quality and transportation planning, local newspaper reporting (primarily identified through NEXIS searches), articles in national newsletters,[3] *Federal Register* notices and regulations pertaining to each area, selected documents from EPA and FHWA files, and other materials provided by interview subjects.
- In ten of the nonattainment areas, the researchers consulted records of their interviews (primarily with staff members of MPOs, air agencies, and state DOTs) conducted for the earlier Harvard study during the period from the fall of 1993 through early 1996.[4]
- In each of the 15 study sites, new personal interviews were conducted with between 11 and 23 individuals knowledgeable about conformity. In all areas, interview subjects included representatives from the MPO, state air agency, state DOT, EPA and FHWA field offices, and environmental advocacy groups. In some areas, interviews were also conducted with state legislative staff, regional or local air agency officials, representatives of other stakeholder groups (primarily business associations), and other knowledgeable observers. In all, the researchers spoke with more than 230 people involved with conformity in the 15 study sites.[5]

Interviews were conducted using *semi-structured, elite* interview techniques. In other words, the researchers did not conduct a survey with a fixed set of questions asked of each subject and then tabulate the results. Instead, the interviews began with a set of basic questions that were adapted – often extensively – for each subject to take account of the locale,

[3]These included, particularly, *Clean Air Report, Mobile Source Report, Links*, and *Transportation and Clean Air Report.*

[4]Information had been collected in person in Boston, Chicago, Houston, and Salt Lake City and by telephone in the remaining six sites.

[5]During the conformity study, the researchers visited seven research sites – Boston, Denver, New York, Northern New Jersey, Portland, San Francisco, and Salt Lake City. Telephone interviews supplemented in-person interviews in these sites. In the remaining research areas, all interviews were conducted by telephone. The typical interview was one hour in length, with the range approximately a half hour to about three hours. A large majority of the interviews were conducted with individual respondents, but some interviews involved two or more respondents at the same time.

the institutional and professional perspectives to which that respondent could speak, and the specific experiences that each respondent had had with conformity. As a particular interview unfolded, the researchers frequently asked questions and explored issues that during their preparations they had not anticipated covering with that subject.

Most information was provided by respondents on the record, but occasionally specific comments were provided on a not-for-attribution or background basis. All of the respondents agreed to allow us to cite their names as sources for the study. Most respondents were familiar with only one research site, but a few (generally federal agency officials or representatives of national environmental advocacy organizations) were knowledgeable about more than one.

Since no interview was exactly the same as any other, this research method precludes tabulation and quantitative analysis of responses to particular interview questions. On the other hand, the researchers were provided with rich, detailed descriptions of the conformity process in each research site, described from a variety of perspectives. Our respondents provided specific accounts of events and institutional relationships in their own locales and shared their insights and evaluative judgments about how conformity is working.

Once this information was compiled, the researchers conducted an intensive within-site and cross-site analysis, seeking to understand the conformity process and the relationships it has created. The findings, generalizations, and conclusions reported here are based on the 15 nonattainment areas in which research was conducted, but the research was sufficiently broadly based to generate plausible hypotheses about what might have been discovered in a more inclusive examination of conformity implementation in major metropolitan areas.

The Research in Perspective

The value of this research thus lies in its description and interpretation of the working experience of 15 major nonattainment areas with this important regulatory mandate. The data available is rich enough to provide a nuanced perspective on institutional relationships in specific areas and to judge whether the experience of individual areas reflects common experiences or special circumstances. The time period investigated is long enough that difficulties associated with the conformity "start-up" can be placed in the perspective of a few more years of experience during which agency working relationships have been established and new analytic procedures have become more familiar. Some early problems have been surmounted, some have not, while other issues have emerged that deserve future study and analysis.

Although this research does not attempt to evaluate the technical dimension of conformity modeling, it seeks to place the technical process in the larger context of the institutional relationships involved, which more technically-oriented research rarely does in any detail.

Any full assessment of conformity, however, is bound to be provisional at this time. By

its nature, conformity's influence must be judged in a more extended time frame, as transportation and air planning processes continue to adapt, expectations and practices evolve, and investment and policy decisions are made and implemented. Since early 1998, events in several of the study sites – including Atlanta, Charlotte, and northern New Jersey – have occurred that deserve careful analysis. That is why a second phase of the Conformity Assessment Project has been planned by EPA and FHWA from the outset.

Nonetheless, the regulatory process does not stand still awaiting formal policy evaluations. Amendments to the regulations and changes in state and regional practice have been made – and may be made again – in light of experience. Even provisional information, systematically collected and assessed, can be extremely valuable. In presenting the findings of this report, the researchers have sought to provide sufficient information about the research sites to allow readers of this report to assess the interpretations and conclusions for themselves. It is therefore hoped that both the data and the findings will prove useful in ongoing policy discussions about conformity at the metropolitan, state, and national levels.

Outline of the Report

- Chapter 2 examines the purposes and requirements of the transportation conformity regulations. Following a short history of efforts prior to the CAAA of 1990 to coordinate transportation investments and air quality regulation, it analyzes the purposes of the conformity regulations as derived both from the statute and regulations and from a broader set of stakeholder expectations. It also describes what the 1993 regulations require of transportation planners and other stakeholders.

- Chapter 3 provides an overview of how the conformity regulations have been applied in the 15 study sites and what difficulties were experienced by each area in applying the several conformity tests.

- Chapter 4 examines how conformity has connected transportation and air quality planning, concentrating on institutional and process issues. It focuses initially on the institutional context in which the 1993 regulations were implemented. Then it explores the roles played by different types of participants – MPOs, state air agencies, state transportation agencies, the federal agencies, and environmental and business stakeholders – as conformity has become an integral part of transportation planning. Finally, it assesses the extent to which conformity has led to the attentiveness and involvement of elected officials and the general public in transportation and air quality issues.

- Chapter 5 explores the impacts of conformity on the substance of both transportation and air quality plans in the study sites. It asks whether the practice of conformity has modified decisions about highway projects, transit, other TCMs, and land use policies. It also

examines whether, in turn, conformity has led to changes in air quality planning.

- Chapter 6 reviews the major findings of the report, assessing the extent to which conformity has created a new "planning arena" that genuinely links transportation and air planning.

- Following the body of the report, an appendix provides capsule histories of the conformity experiences of each of the 15 study sites.

- Another appendix identifies the interview respondents whose accounts and observations form the key source of project data in each study site.

- Additional appendices provide a glossary, identify the sources of population and transportation data for the study sites, and provide information about the authors.